

**SYSTEM FOR CONVERTING HARDWARE DESIGNS IN HIGH-LEVEL
PROGRAMMING LANGUAGES TO HARDWARE IMPLEMENTATIONS**

Abstract of the Disclosure

A computer aided hardware design system for enabling design of an actual
5 hardware implementation for a digital circuit using a high-level algorithmic programming
language. The system converts an algorithmic representation for a hardware design
initially created in the high-level programming language, such as ANSI C, to a hardware
design implementation, such as an FPGA or other programmable logic or an ASIC. The
C-type program representative of the hardware design is compiled into a register transfer
10 level (RTL) hardware description language (HDL) that can be synthesized into a gate-
level hardware representation. The system additionally enables simulation of the HDL
design to verify design functionality. Finally, various physical design tools can be utilized
to produce an actual hardware implementation. The system also permits the use of other
non-C-type high-level programming languages by first translating to a C-type program. In
15 contrast to previous hardware design tools, the system compiles all C-type programming
language features, including pointers and structures, into synthesizable HDL.

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